Abstract
Contextual factors are shown to influence the design and implementation of a university project in a developing country. The case study involves a capacity building Computer Science project between two Ethiopian universities and the VU University Amsterdam. Even with the best project plans, the study shows how availability of staff impacts on implementation. There are various tensions between the all-important staff development objectives which result in staff being sent abroad for several years and other objectives such as curriculum development and co-teaching of new courses. Furthermore, there is a potential tension between the demand-driven aspects of present day development projects versus the traditional interest of academic cooperation. The views of both northern and southern partners are highlighted and shown to be complementary rather than disruptive.

Introduction
Many projects are designed to build capacity in newly created departments in the South. By linking these with expertise in the north, such projects help build human capacity through formal qualifications, curriculum review – including materials production, co-teaching of new courses and equipment provision. In theory, a project which is well planned with a SMART logical framework, detailed work plans and budgets and willing partners is likely to progress in an orderly fashion. While this may be true for some projects, in practice the progression may be quite different. This case study about the DECODE project, an acronym for Development of Computer Science and Information Technology Departments, demonstrates the influence of the context and the nature of cooperation on project implementation. The project is one of several in the Netherlands Programme for strengthening Post-secondary education and training capacity in Ethiopia.

The paper contrasts the development needs of the southern partner in the process of capacity building against the academic interests of the established partner in the North which should also be satisfied for the mutual benefit of both parties.
Background
Ethiopia has 80 million inhabitants, with only Nigeria and Egypt having more people in Africa. The Gross Domestic Product per capita is US $146 and this is one of lowest GNI in Africa (rank 47 out of 51). Ethiopia is thus one of the poorest countries in the world. However, it has a rich cultural heritage and long history of independent rule. The population is a mix of various ethnic, linguistic and religious groups.

Recuperating from a dictatorial regime that ended in 1991, it has embarked on a road towards economic progress and improving human rights. Education is now seen as the route to economic development, yet until the 1990s there were only two universities; Addis Ababa University in the capital and Alemaya to the east. With the rapidly growing educational needs and the call for more decentralisation, six new universities were started in the closing decade of the 20th century by upgrading existing colleges and polytechnics, mainly in provincial capitals. The expansion of higher education continued in the new century and by 2009 there were 21 public universities.

The NPT programme (2004-2010) thus came at an opportune time to help develop and strengthen the higher education system. The programme comprises ten major projects: half of these focus at system level and have a national impact while the other half support various academic departments in the new universities. The DECODE project is an example of the latter (Smit, Amare & Belay 2007).

ICT context analysis
Like many developing countries, Ethiopia has a scarcity of well trained personnel in computer science and information technology. Until recently, only Addis Ababa University offered Bachelor and Master degrees in this field. To address this shortage, departments and faculties of Computer Science and Information Technology (CS&IT) were recently established in the new universities. Staffing these departments continues to be problematic. In addition to the problem of few trained staff is one of staff mobility. Staff members leave for more attractive positions in the public and private sectors. The considerable turnover of staff results in loss of experience and morale in departments. At the same time, programmes are expanding with many more students registering for courses in this increasingly popular field.

In addition to personnel factors, the infrastructural environment is another challenge. Internet connectivity is variable and general slow when available. There are frequent power cuts which last all day and computer viruses are
rife and not systematically managed. A project operating in such an unstable environment needs to pay attention to these aspects when designing and implementing interventions.

**The design of the project**

The Centre for International Cooperation (CIS) is the focal point at VU University Amsterdam for development projects (Kool & Smit, 2003). While another NPT project focused at a systems level on ICT policy for higher education institutions in Ethiopia, the DECODE project linked two new departments of CS&IT at the Universities of Arba Minch (AMU) and Bahir Dar (BDU) with the VU’s Department of Computer Science.

In common with similar so-called ‘linkage’ projects in medicine, law and veterinary science, the intended outcomes were:

1. Staff capacity development through formal postgraduate programmes and on-the-job training
2. Curriculum reform and teaching materials production
3. Co-teaching of the new curriculum by northern and southern partners
4. Resource provision in the form of equipment and textbooks.

Since the departments of CS & IT had very small numbers of lecturers (most were graduate assistants without a further degree), a major outcome of the project would be trained staff with reputable Masters degrees. This would be an incentive for the staff concerned since their appointments as lecturers would only be possible with such a qualification.

The second outcome would be that a new curriculum with twelve modules had been developed to sustain the teaching and learning in the new Bachelor programmes. Thirdly, that northern and southern staff would co-teach components of the new curriculum in order to assess and refine it. Fourthly, the provision of books and equipment would help build the departments.

**Staff Capacity Development**

A wide range of academic staff, lecturers, senior lecturers and professors from VU University were available for assisting in the development of modules and trialling out with students during short visits to in Ethiopia. Longer involvement to actually teach in the new bachelor programme was more problematic and this was made clear from the start.

The BDU department had only three qualified staff members: two with Masters and one with an IT-related Ph.D. degree (the only PhD holder at the time in any
university outside Addis Ababa University). AMU had only two lecturers with Master degrees. Both departments had only recently started with their Bachelors programmes so had many students, but no graduates at this stage. Nevertheless, these staff complements were considered sufficient to start the collaborative effort.

Early in the inception period (2005) the situation deteriorated. The only staff member with a PhD left BDU for the new Ethiopian ICT Development Agency. The two experienced staff members at AMU left to pursue PhDs, one at Delft University of Technology in the Netherlands and the other to a university in India. Neither has returned to the department during the life of the project.

Clearly, further recruitment of staff was necessary. The project offered 20 scholarships for a Master degree to staff, but regulations stipulated that the candidates (graduate assistants) must have at least one year of working experience. During the three months inception phase, only two graduate assistants qualified at BDU and not one at AMU.

In the first year of the project, only these two were awarded scholarships to pursue a Masters degree at VU University, but a considerable number of young staff was appointed at the two universities. After the compulsory service requirement, two were awarded scholarships at VU University, eight at Putra University in Malaysia and another eight pursued a similar study in-country at Addis Ababa University. Placing them in a range of institutions was a deliberate choice, not only for financial reasons, but also to diversify experiences. Thus in the end, twenty young Ethiopian graduates embarked on various Masters programmes.

Curriculum development

As a consequence of the critical shortage of staff, the capacity development component of the project directly impeded curriculum development which ideally should have included all stakeholders. For the development of twelve new modules for the undergraduate programme, there were only two lecturers at BDU and one newly appointed lecturer at AMU. Despite this, the project decided to continue and started with professional and graduate profiles as part of a needs analysis. By interviewing employers (in the private and public sector) as well as employees (older and recent graduates), elements for a new B.Sc. curriculum were identified such as new topic areas, practical assignments, improved courses and the need for an internship.

The new modules were drafted in short visits of Ethiopian staff to VU University, and in the opposite direction by VU staff. Midway through the project, the only
lecturer at AMU left and no-one from there was available for module development for the rest of the project. The day was saved by BDU which managed to appoint more staff with Masters degrees from Addis Ababa University.

The project thus managed to develop twelve new modules under far from ideal conditions and with limited AMU involvement. Increased attention was given not only to relevant content, but also to didactical aspects. The results have been published in new course readers, laboratory manuals and course outlines.

**Co-teaching the new curriculum**

Although VU University staff was not available for long periods of teaching, this was not felt a major obstacle. On the contrary, the Ethiopian staff felt strong ownership of the new curriculum and the new courses from the start. It was they who developed the first draft of the new courses, albeit with assistance from VU University staff during short visits to the Netherlands.

Visits of VU University staff in the opposite direction to the departments in Ethiopia were used for co-teaching parts of the new modules, sharing ideas about didactical issues, implement practical activities and improving the materials. On two occasions, it proved more convenient to involve two staff members from the Hogeschool van Amsterdam (a university of applied science) since their expertise matched the needs in Ethiopia. Since both of them had been affiliated with VU University, there was excellent alignment with the project’s goals.

**Resource provision**

The northern partners were surprised to find good student computing facilities on both campuses. Although internet connectivity and campus networks were only slowly developing, project support was not necessary for the student computer laboratories which had already received World Bank funding. DECODE therefore decided to support the increasing number of staff with much needed hardware and access to the Internet.

Investments were also made in student textbooks, while electronic access to academic journals was made possible by arrangement with the Institute of Electrical and Electronics Engineers, the world’s largest professional association advancing innovation and technological excellence.

**Discussion**

The NPT programme is a capacity building programme where southern partners are assisted in solving capacity problems (Kouwenhoven, 2009). Like other linkage projects, the timescale for DECODE was short and much was expected
to be achieved in limited time. Given these time constraints, the components of ‘capacity building’ actually compete with each other. Formal staff development is seen as of prime importance by southern partners, more so than any other activity. Yet, given that overseas Masters take a minimum of two years (in addition to the probationary year as graduate assistants), this competes directly with curriculum and materials development and with co-teaching (both of which are also capacity building activities). Irrespective of commitment of all parties to the project outcomes, there were times when a critical mass of staff was lacking. It is too early to say whether project outcomes are sustainable given this background. However, a new and relevant curriculum is in place, new modules have been developed and at least some of the staff is expected to be available for delivery in the foreseeable future.

So far discussion has centred on gains for the southern partners. However, there is a potential tension between ‘capacity building’ in development projects and ‘academic cooperation’ which is of prime interest for universities in Europe. Clearly, first priority is assistance to the south, though northern partners also have an interest in academic cooperation to advance training and research.

Box 1: Views of two southern partners who were awarded DECODE scholarships to study abroad (male in the Netherlands, female in Malaysia).

<table>
<thead>
<tr>
<th>On research</th>
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<tbody>
<tr>
<td>• It showed us how to write research and a thesis</td>
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<tr>
<td>• We know how to do research individually and with a team</td>
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<td>• We got the opportunity to experience the latest research activities</td>
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<table>
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<tr>
<th>On teaching and learning</th>
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<tr>
<td>• It showed us to cope with the dynamics of the computing discipline</td>
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<tr>
<td>• We have seen how advisers and instructors have good interactions with students</td>
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<td>• We have interacted with other people and worked on social skills</td>
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<table>
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<tr>
<th>On other benefits</th>
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<tr>
<td>• It helped us to understand the world and different cultures</td>
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<tr>
<td>• Our English Language skills have improved tremendously</td>
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<tr>
<td>• New interests have been discovered and future career opportunities</td>
</tr>
<tr>
<td>• It has made us strong and more responsible people</td>
</tr>
<tr>
<td>• We have learnt with international students.</td>
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From the onset, the project tried to address these different interests. Most important for a successful merger were the interests of the academic staff in question. For Ethiopian staff, foremost was a further formal qualification, including exposure to academic work in a northern research university and opportunities to acquire more competencies in teaching and research (Box 1). Given the large differences between northern and southern Computer Science departments, one might predict only limited interest in the project by the northern partners. However, this was not the case and a total of 14 staff was involved in various project activities. The high level of VU staff involvement was a mixture of genuine interest to alleviate the problems of colleagues in their difficult academic environment, as well as the opportunity to see at first hand a totally different context through short missions (Box 2).

**Box 2: Condensed views of four VU staff about the cooperation.**

- Short visits allow one to assess the real situation. A curriculum may look good on paper but when visiting, one is able to spot and discuss difficulties (and opportunities) which include the malware-infested computers, the lack of a server, the lack of uniformly available course material and the lack of a practical orientation in the curriculum.
- A visit allows one to much better tailor the recommendations and course improvements to the local situation.
- A week allows one to set things in motion which subsequently need to be picked up by the local staff and students. Even short visits breed valuable contacts.
- Now that I’ve been to the university myself I can more easily understand why communication was so difficult at a distance: there are times when it is hard or downright impossible for local staff to read your emails.
- The challenges that the teachers have to face in Ethiopia are very complicated:
  1. strong hierarchical bureaucracy
  2. very high student/staff ratios
  3. limitations in the basic needs like stable electricity and Internet connections
  4. diversity in the cultural backgrounds of the students and their educational levels
- A working week contains seven days, mainly due to the instability of the power grid, where lectures are necessarily rescheduled to the weekends.
- Unfortunately, having researchers spend a semester each year in Ethiopia is not very realistic. In the simplest terms, most researchers cannot afford to spend a prolonged period of time on a regular basis in a place that is not conducive to their own research/career.
VU staff thus gained important insights into educational and curriculum development initiatives in developing countries, as well as a unique opportunity to visit a fascinating country. VU University was benefiting at an institutional level by having a group of internationals students in their Masters, and possibly later in the PhD programme. In other words, the seeds of academic cooperation are planted and can be expected to grow and come to fruition in due time.

In terms of lessons learnt on project design and implementation, the best approach is undoubtedly a pragmatic one and a shared desire to find solutions at each step. Despite many challenges, the most crucial factor for eventual success is the willingness of both parties to work together on strategies to move forward.

References
